remote sensing

Supplementary Materials for

Ozone Continues to Increase in East Asia Despite Decreasing NO_2: Causes and Abatements

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This file includes:

Figs. S1 to S7

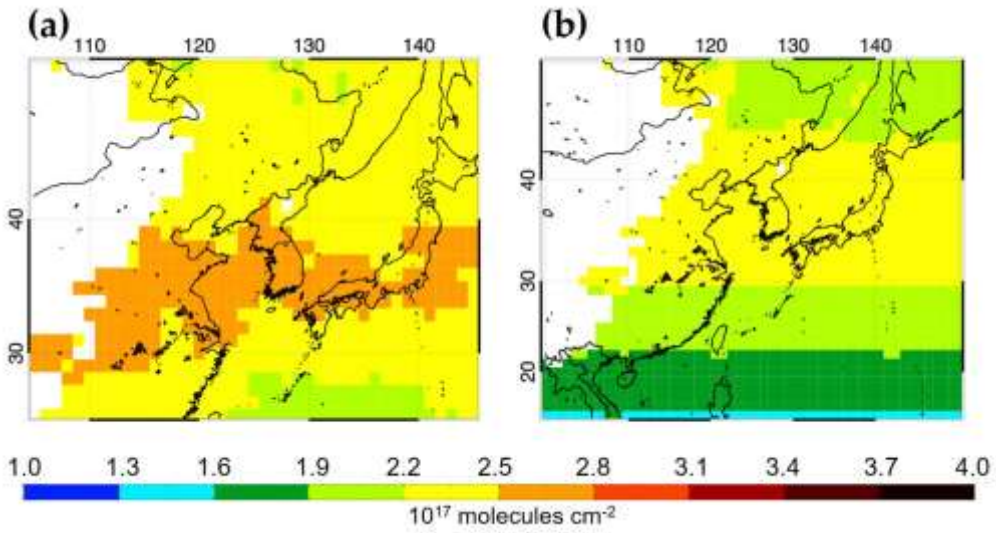


Fig. S1. Spatial distributions of (a) SAO-retrieved OMI lower free tropospheric O_3 (900–700 hPa) averaged for May 2016, and (b) a priori tropospheric O_3 partial columns derived from climatological information (to compare with (a)).

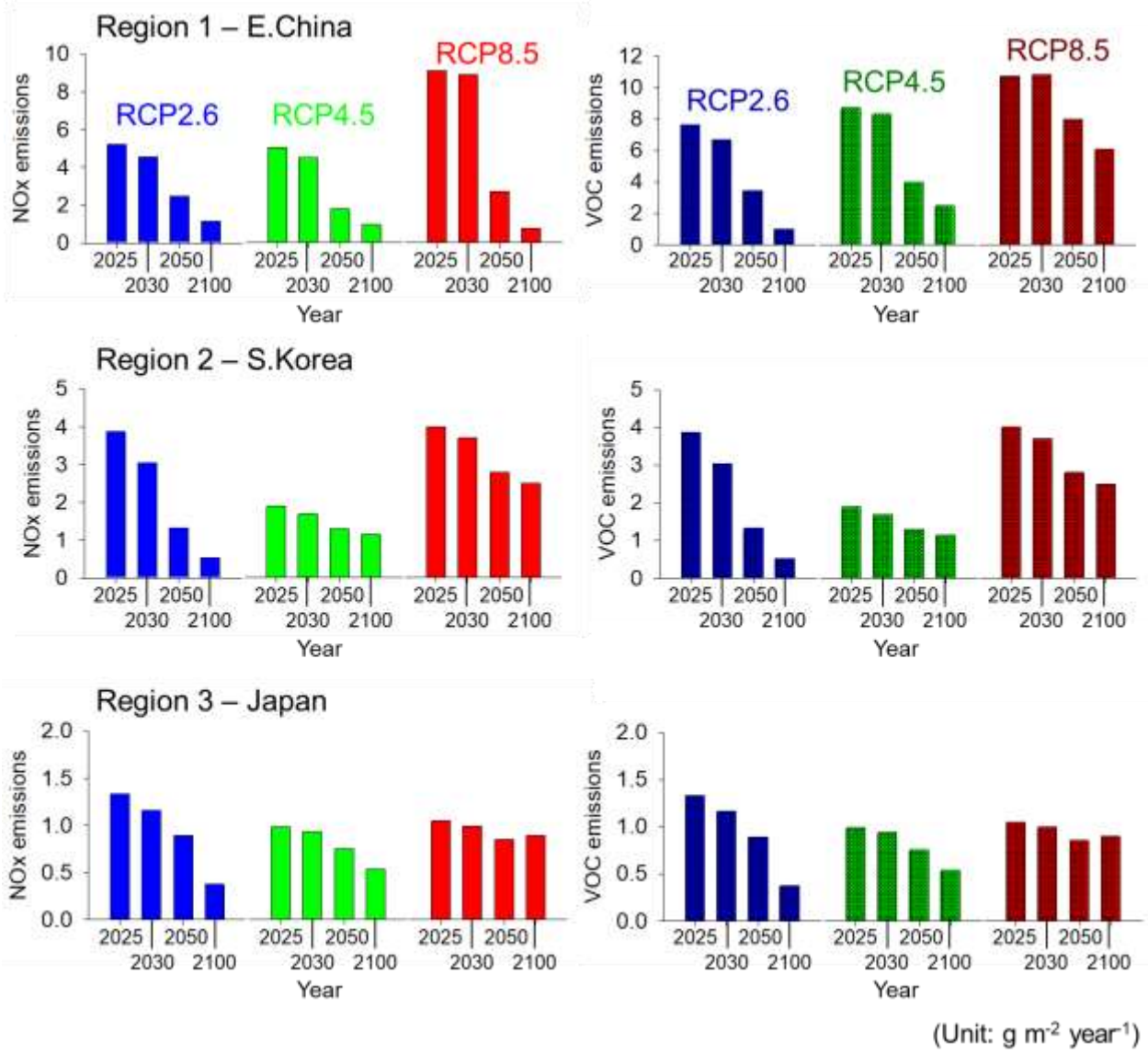


Fig. S2. Projected emissions of VOCs and NO_x from 2025 to 2100 under different IPCC-RCP/AR5 scenarios (RCP2.6, RCP4.5, and RCP8.5) for China, Korea, and Japan.

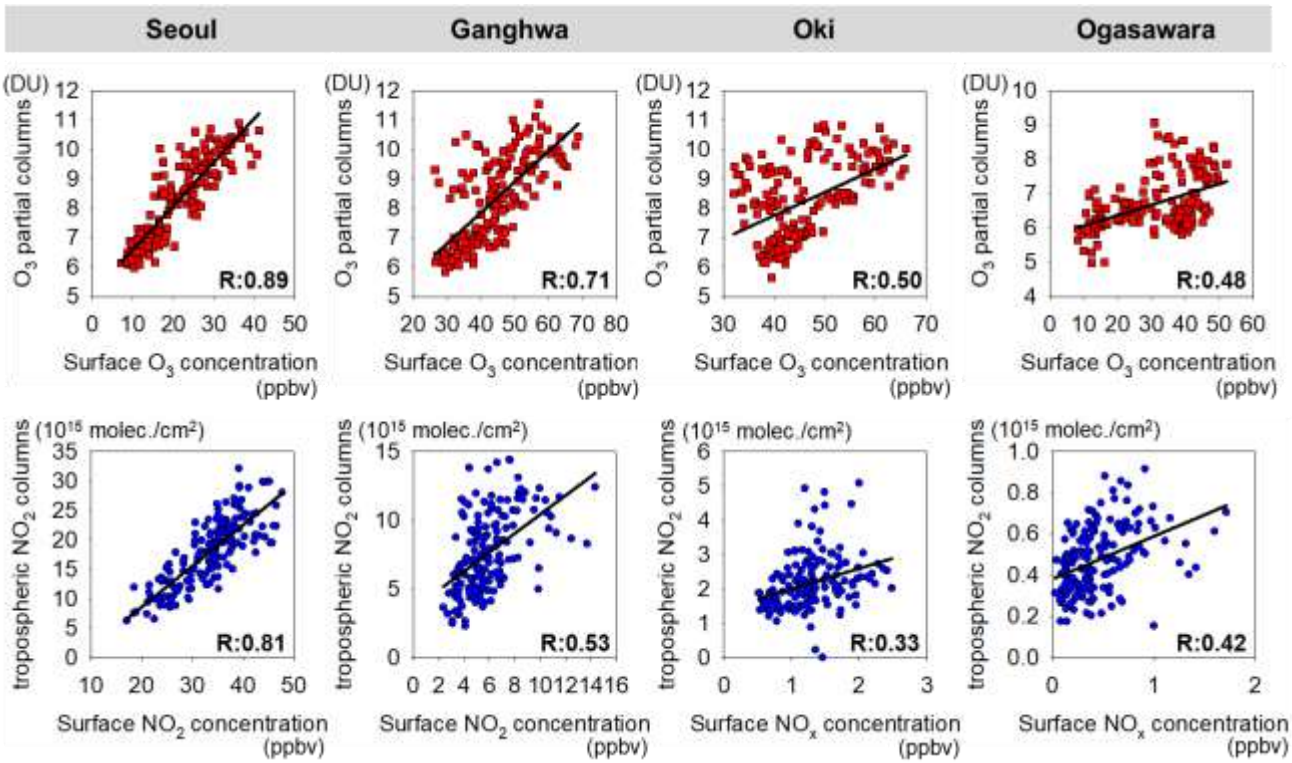


Fig. S3. Scatter plots of in-situ ground measurements vs. satellite measurements for O_3 (top) and NO_2(bottom), respectively. Here, satellite O_3 measurements (y-axis in top panel) denotes lower free tropospheric O_3 concentrations extracted from satellite column signals. Also note that surface NO_2 concentration (x-axis in bottom panel) was used in Seoul and Ganghwa, while NO_x was employed in Oki and Ogasawara. Note that relatively lower consistency in Oki and Ogasawara were ascribed to lower in-situ photochemical formation with maximum ozone concentrations of 2~3 ppb in both two background sites.

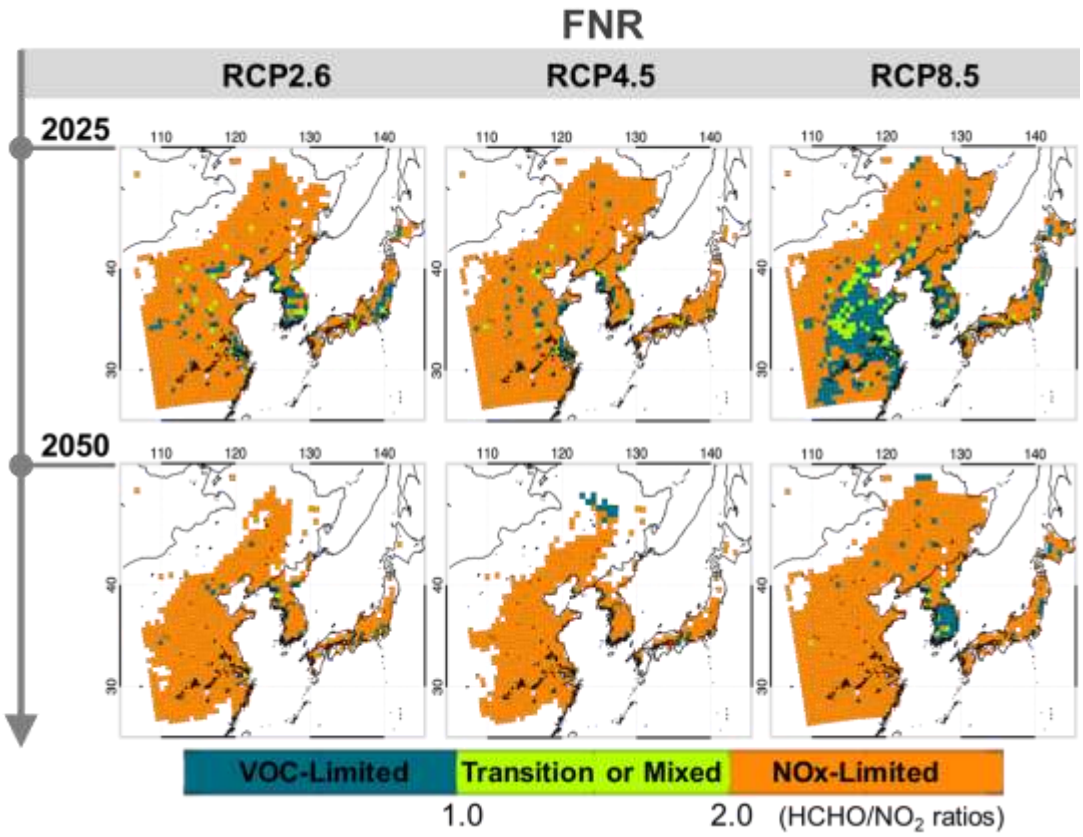


Fig. S4. Projected spatial distribution of HCHO-to-NO_2 Ratio (FNR) in 2025 and 2050 under RCP2.6, RCP4.5, and RCP8.5.

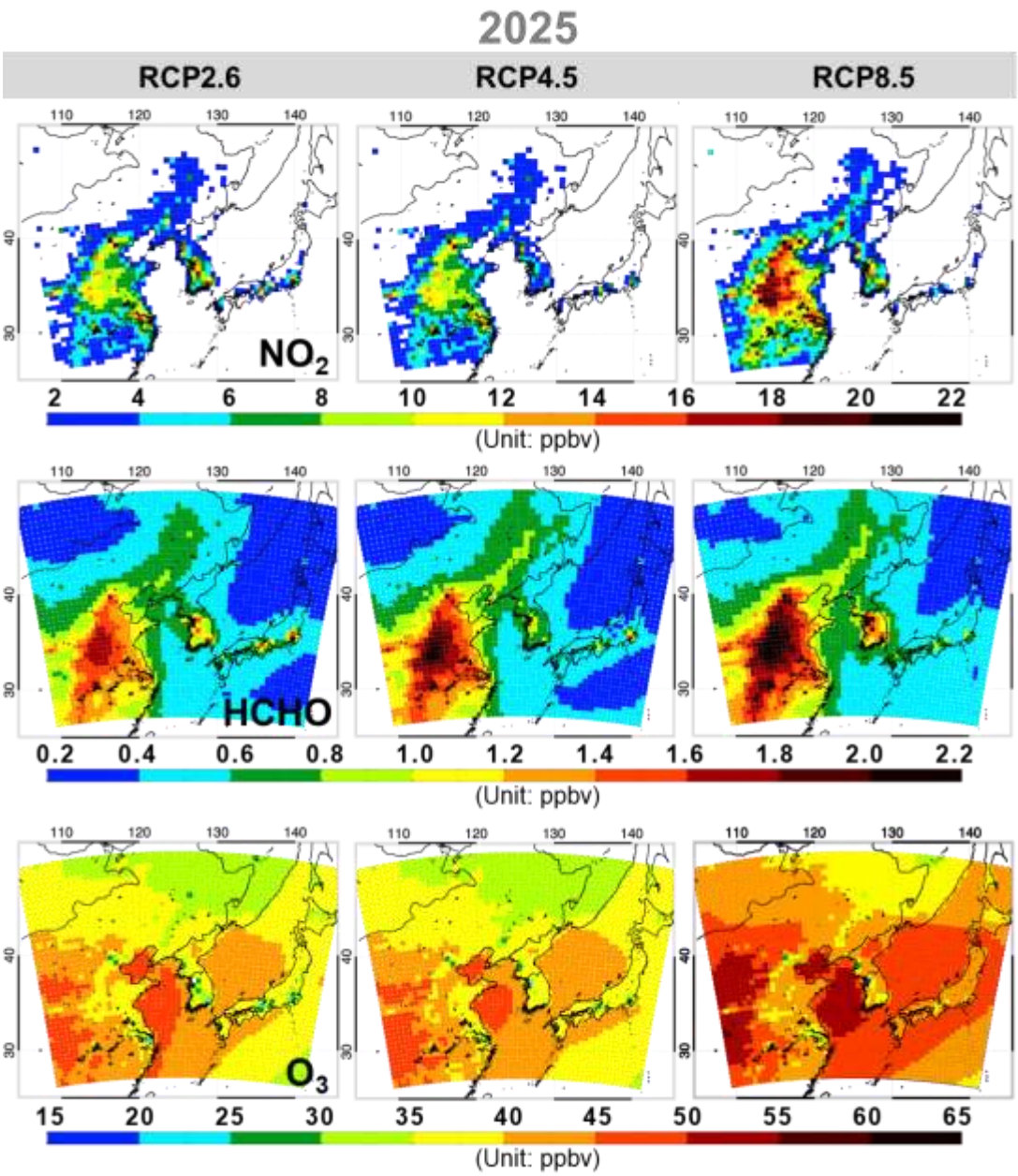


Fig. S5. Projected spatial distribution of surface NO_2, HCHO, and O_3 in 2025 under RCP2.5, RCP4.5, and RCP8.5.

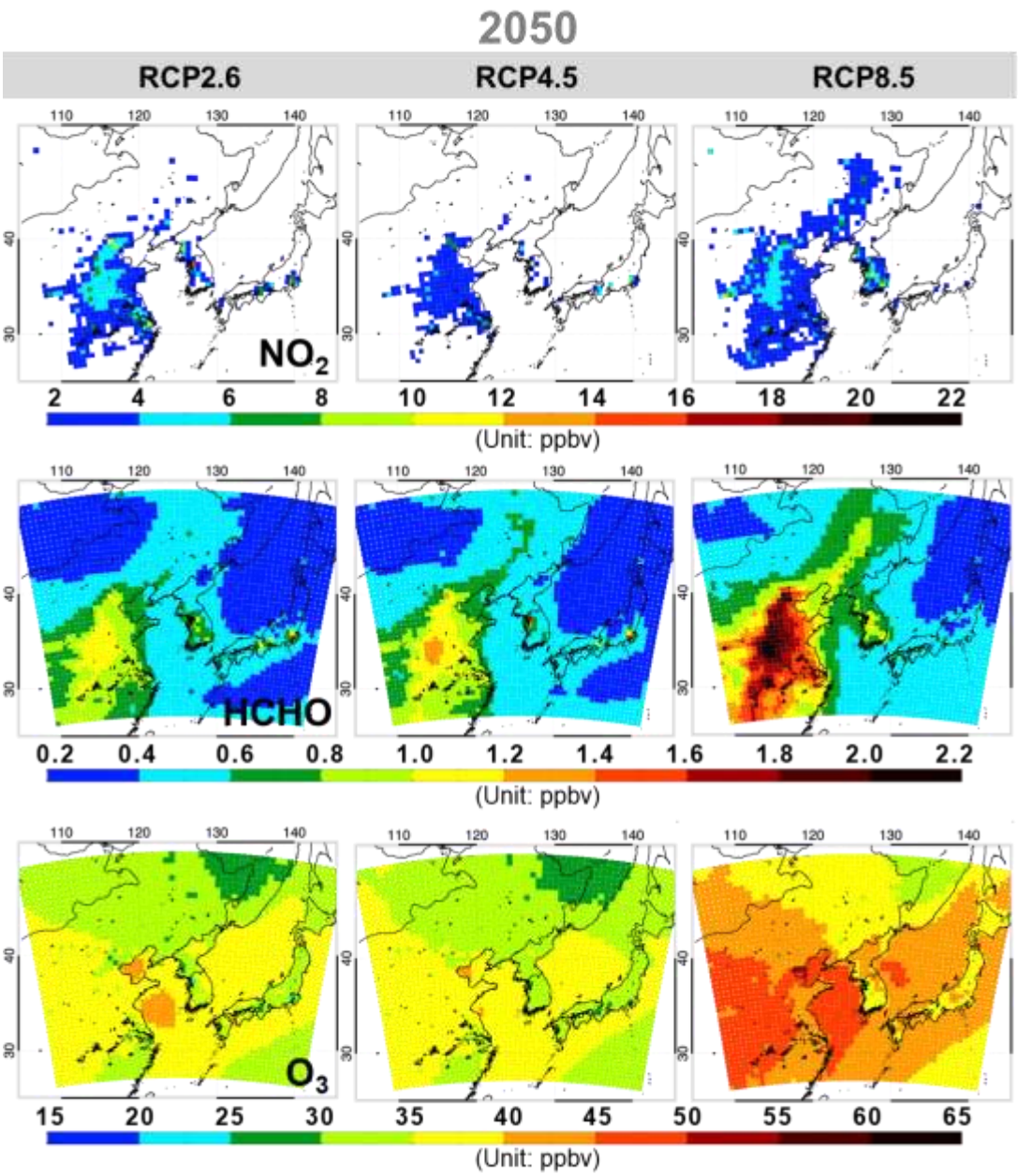


Fig. S6. Same as Fig. S5, except in 2050.

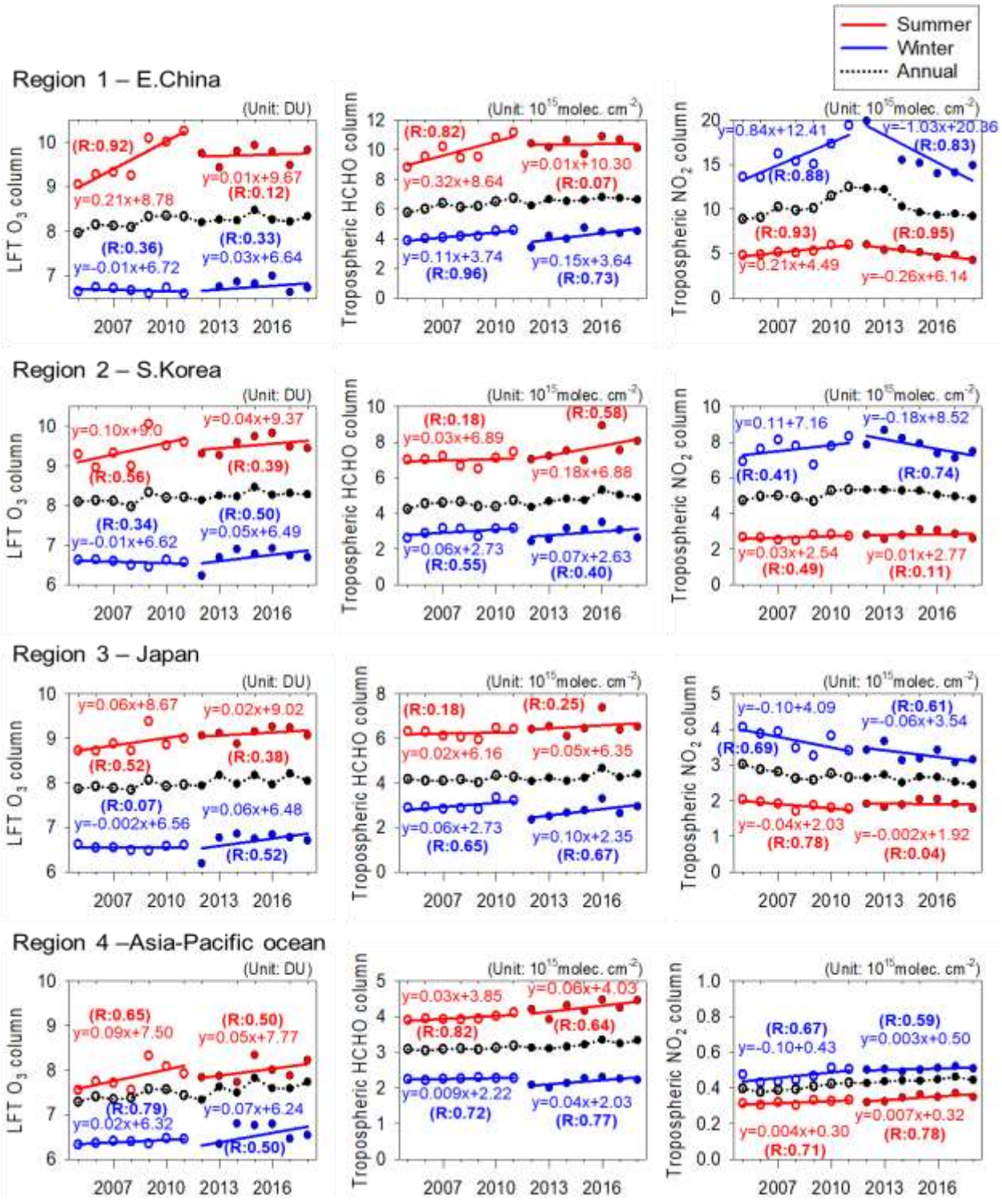


Fig. S7. Long-term trends for whole year (black), summer (black), and winter(blue) in lower free tropospheric O_3 columns, tropospheric HCHO and NO_2 columns averaged over the rectangular regions 1–4 from 2005 to 2018, measured from an OMI. Note that R is the correlation coefficient, and *x*=1 at the starting year of 2005 in the regression lines.